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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/807,489

03/23/2004

Matsuhiko Nishizawa

10939/2172

3061

29932

7590

08/08/2006

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EXAMINER

LILLING, HERBERT J

ART UNIT

PAPER NUMBER

1651

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/807,489

Applicant(s)

NISHIZAWA ET AL.

Examiner

HERBERT J. LILLING

Art Unit

1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on March 23, 2004 (Priority Papers).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. Receipt is acknowledged of the prior art information disclosure statement filed July 27, 2004.

2. Claims 1-21 are pending in this application.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claim 1, drawn to functional derivative of a quinone molecule, non-classifiable due to the lack of a complete structure of the molecule.

Claims 2-6 will be examined with this invention.

II. Claims 7-17, drawn to an electrode comprising a mediator according to any one of claims 1-6 which claims are considered to be improper multiple dependencies, cannot be properly classified.

III. Claims 18-20, drawn to a biofuel cell which includes an enzyme, a fuel substrate (fuel), and electrodes comprising a cathode and an anode according to claim 7 for the electrodes which claims are improper due to the multiple dependencies and a proper classification cannot be made to the lack of a generic structure.

IV. Claim 21, is drawn to a compound, classified in Class

3. Inventions I and II/III are related as product and process of use.

The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another

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materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case the quinone molecule can be used in a totally different apparatus eg. electrophotographic photoreceptors since naphthoquinones are known to have the capabilities as photosensitive layers.

4. Claims are generic to the following disclosed patentably distinct species:

A. A molecule comprising a quinone derivative:

Aa. Which is a naphthoquinone derivative;

Whereby the derivative is:

i. is one or more kinds of a naphthoquinone molecule chosen from the group consisting of

ia. a sodium anthraquinone-2-sulfonate (AQS) derivative

ib. a 2-methyl-1,4-naphthoquinone (VK.sub.3) derivative.

xba > is a 2-methyl-1,4-naphthoquinone (VK.sub.3) derivative.

Whereby above xba derivative is selected from the following functional groups:

Xa>amino group,

Xb> a carboxyl group,

Xc> a chloroformyl group,

Xd> a succinimide oxycarbonyl group,

Xe>an alkyl metal sulfosuccinimide oxycarbonyl group,

Xf> a pentafluorophenyl oxycarbonyl group,

Xg>a p-nitrophenyl oxycarbonyl group,

Xh>a hydroxyl group,

Xi> a formyl group,

XJ>a halogen group,

Xk>a maleimide group,

Xm> an isothiocyanate group,

Xn> an oxiranyl group

Or

Xp>more than one functional

Group-please specify.

**Furthermore whereby the 2-methyl-1,4-naphthoquinone (VK3) derivative is one or more kinds of a quinone molecule selected from the group consisting of :**

AA1: 2-(3-carboxypropyl)-3-methyl-1,4-naphthoquinone (CPVK.sub.3) represented by the following formula (1)

AA2: 2-3-[N-(2-aminoethyl)aminocarbonyl]propyl}-3-methyl-1,4-naphthoquinone (AEACPVK.sub.3) represented by the following formula (2),

AA3: 2-(3-aminopropyl)-3-methyl-1,4-naphthoquinone (APVK.sub.3) represented by the following formula (3). 8

Ab. Which is any other quinone derivative-please specify.

B: Whereby the enzyme is

a. not immobilized;

- b. immobilized
- C. Whereby the enzyme contains:
  - x. diaphorase
  - y. diaphorase and dehydrogenase
- D. Whereby the electrode of above Cx or Cy comprises:
  - a. further comprising NADH immobilized;
  - b. does not further comprising NADH immobilized.
- E. Whereby an electrode comprising an enzyme immobilized comprising the mediator:
  - m. comprising an enzyme immobilized on the electrode by a polymer and a crosslinking agent;
  - n. comprising an enzyme immobilized on the electrode by only a polymer.
- F. Whereby the polymer is:
  - p. polyvinylimidazole;
  - q. other polymer-please specify;
- G. Whereby the crosslinking agent is:
  - i. polyethylene glycol diglycidyl ether;
  - ii. other please specify.
- H. Whereby the electrode contains:
  - o. an oxygen separation membrane;
  - p. no oxygen separation membrane.

The species are independent or distinct because each one of the above is distinct from each other and are considered to be patentably distinct from each other. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, even though this requirement is traversed. Applicant is advised that a reply to this

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requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

5. Applicant is advised that the reply to this requirement to be complete must include (i) an election of Inventions I, II, III or IV and elections of each of A-H of a species to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

It is noted that there are multiple elections of species under Aa. If Applicant is not able to decipher the election request, Applicant is requested to contact this Examiner for assistance.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

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Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103 (a) of the other invention.

6. Furthermore, it is noted that the specification may be found to be fatally defective for the broad claimed inventions involving a quinone molecule derivative whereby the derivative is modified with one or more kinds of a functional group selected from the groups as noted above as Xa-Xp which scope of the description of the molecules cannot be determined. Any election other than Invention IV may be considered to lack sufficient information as to the modification of the quinone molecule derivatives since the functional groups can be located on any number of atoms and the specification lacks any generic claim indicating the positions and the number of "one or more kinds of a functional group" attached. This rejection may be applied even to the claim 6 [ even if the improper multiple claim is corrected by amendment] since the language of the claims contains the improper undefined scope of the derivatives.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).



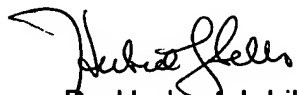
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8. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Examiner Lilling whose telephone number is 571-272-0918 and Fax Number is (703) 872-9306** or SPE Michael Wityshyn whose telephone number is 571-272-0926. Examiner can be reached Monday-Thursday from about 5:30 A.M. to about 3:00 P.M. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://portal.uspto.gov/external/portal/pair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit **1651**  
August 07, 2006



Dr. Herbert J. Lilling  
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Group 1600 Art Unit 1651